because of the remote locations, lack of access, and rugged terrain, of the land, and their inclusion within the State Conservation District where State land-use controls severely limit development and most activities. The proposed critical habitat designations were expected to cause little or no increase in the number of section 7 consultations; and few, if any, increases in costs of projects or delays in, or modifications to planned projects, land uses and activities.

Issue 8: Economic Issues

(27) *Comment:* We should have been directly contacted for our opinions on the economic impacts of critical habitat designation.

Our Response: The methodogy outlined in the economic analysis report relies primarily on information provided by the Service, the State of Hawaii's Department of Land and Natural Resources (DNLR), and the consultant, Decision Analysts Hawaii, Inc. (DAHI). To better understand the concerns of stakeholders, the Service solicited comments and suggestions from the public, other concerned government agencies, the scientific community, industry, and other interested parties concerning aspects of the proposed rule and the proposed critical habitat. These comments and suggestions were taken into consideration in conducting the economic analysis. Additional clarifications were obtained directly from landowners and other parties.

In addition, we have revised the November 7, 2000, proposed designations to incorporate new information, and/or address comments and new information received during the three comment periods. In addition, we will conduct an analysis of the economic impacts of designating these areas as critical habitat prior to a final determination and revise the economic analysis. When completed, we will announce the availability of the draft revised economic analysis with a notice in the **Federal Register**, and we will open a 30-day public comment period on the revised draft economic analysis and proposed rule at that time. In addition, we will mail letters to landowners and other interested parties and publish a notice in the *Garden Island* newspaper announcing the availability of and seeking public comment on the draft economic analysis and proposed rule. We would strongly encourage anyone who has information or opinions concerning the economic impacts of this proposal to provide them to us.

(28) *Comment:* The Service failed to properly consider the economic (e.g., costs associated with hunting, costs associated with section 7 consultation, etc.) and other impacts (e.g., special management protections on private lands, planned highway projects, diminished activities on military lands, etc.) of designating particular areas as critical habitat.

Our Response: We originally proposed designation of critical habitat for 76 plants from the islands of Kauai and Niihau on November 7, 2000. On March 7, 2001, we published a notice announcing the availability of the draft economic analysis on the November 7, 2000, proposal. That draft economic analysis concluded that for the most part the critical habitat designations for Kauai and Niihau generally will have modest economic impacts. They are expected to cause little or no increase in the number of section 7 consultations with the Service; few, if any, increases in costs associated with consultations; and few, if any delays in, or modifications to planned projects, land uses and activities. These findings reflect the following:

—Nearly all of the land within the critical habitat units is unsuitable for development as well as for most projects, land uses, and activities. This is due to the remote locations, lack of access, and rugged terrain.

—On Kauai, nearly all of this land (98.5 percent) is within the State Conservation District where State land-use controls, severely limits development and most activities.

—Very few of the current and planned projects, land uses, and activities that could affect the proposed critical habitat units have a federal involvement requiring section 7 consultations with the Service, so they are not restricted by the Service requirements.

—And most of the activities that do have federal involvement are operations and maintenance of existing facilities and structures, so they would not be impacted by the critical habitat designation.

We have revised the proposed designations to incorporate new information, and/or address comments and new information received during the comment periods. In addition, we will conduct another analysis of the economic impacts of designating these areas as critical habitat prior to a final determination. When completed, we will announce the availability of the draft economic analysis with a notice in the **Federal Register**, and we will open a 30-day public comment period on the draft economic analysis and proposed rule at that time.

Summary of Changes From the Previous Proposal

We originally determined that designation of critical habitat, for 76 plants from the islands of Kauai and Niihau on November 7, 2000. These species are: *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus clayi, Hibiscus waimeae* ssp. *hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea membranacea, Schiedea nuttallii, Schiedea spergulina* var. *leiopoda, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Sesbania tomentosa, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Viola helenae, Viola kauaiensis* var. *wahiawaensis, Wilkesia hobdyi, Xylosma crenatum,* and *Zanthoxylum hawaiiense.* No change is made to these prudency determinations in this revised proposal and they are hereby incorporated by reference (65 FR 66808). In this proposal we have revised the proposed designations for the 76 plants based on new information received during the comment periods. In addition, we incorporate new information, and/or address comments and new information received during

the comment periods on the November 7, 2000, proposal.

In the November 7, 2000, proposal we did not propose critical habitat for three species of loulu palm, *Pritchardia aylmer-robinsonii, P. napaliensis,* and *P. viscosa.* We determined that critical habitat designation was not prudent because it would likely increase the threats from vandalism or collection of these species on Kauai and Niihau. No change is made to these determinations here and they are hereby incorporated by reference (65 FR 66808). In that proposal, we also determined that critical habitat was not prudent for *Melicope quadrangularis* and *Phyllostegia waimeae,* two species endemic to Kauai, because they had not been seen recently in the wild, and no viable genetic material of these species was known to exist. Due to new information received during the comment periods regarding the rediscovery of *Phyllostegia waimeae* on Kauai, we have reconsidered our earlier finding and determine that critical habitat is prudent for this species because we believe that such designation would be beneficial to this species. Designation of critical habitat is proposed for this species on Kauai. No change is made here to the November 7, 2000, not prudent determination for *Melicope quadrangularis* and it is hereby incorporated by reference (65 FR 66808).

In the November 7, 2000, proposal we did not determine prudency nor propose designation of critical habitat for 14 species that no longer occur on Kauai and Niihau but are reported from one or more other islands. We determined that critical habitat was prudent and proposed designation of critical habitat for nine of these species (*Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Hibiscus brackenridgei, Ischaemum byrone, Mariscus pennatiformis, Phlegmariurus manni, Silene lanceolata,* and *Vigna o-wahuensis*) in other proposed rules published on December 18, 2000 (Maui and Kahoolawe), on December 27, 2000 (Lanai), and on December 29, 2000 (Molokai). In this proposal, no change is made to the earlier prudency determinations for these nine species and they are hereby incorporated by reference (65 FR 79192, 65 FR 82086, 65 FR 83158). In this proposal, we propose designation of critical habitat for *Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Ischaemum byrone,* and *Mariscus pennatiformis* on the island of Kauai, based on new information and information received during the comment periods on the November 7, 2000, proposal. Critical habitat is not proposed for *Hibiscus brackenridgei, Phlegmariurus manni, Silene lanceolata,* and *Vigna o-wahuensis* on the islands of Kauai and Niihau because we are unable to determine habitat which is essential to their conservation on these islands.

No change is made here to the prudency determination for *Acaena exigua,* a species known only from Kauai and Maui, published in the proposed rule for Maui and Kahoolawe on December 18, 2000, and it is hereby incorporated by reference (65 FR 79192). In that proposal, we determined that critical habitat was no prudent for *Acaena exigua* because it had not been seen recently in the wild, and no viable genetic material was known to exist.

In this proposal, we determine that critical habitat is prudent for four other species (*Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans, Solanum incompletum*) for which prudency determinations have not been made previously, and that no longer occur on Kauai but are reported from one or more other islands. These four plants were listed as endangered species under the Act, between 1991 and 1996. At the time each plant was listed, we determined that designation of critical habitat was not prudent because designation would increase the degree of threat to the species and/or would not benefit the plant. In this proposal, we determine that critical habitat is prudent for these four species because we believe that such designation would be beneficial to these species. Critical habitat is proposed at this time for *Phlegmariurus nutans* on Kauai based on new information and information received during the comment periods on the November 7, 2000, proposal. Critical habitat is not proposed for *Achyranthes mutica, Isodendrion pyrifolium,* and *Solanum incompletum* on the islands of Kauai and Niihau because we are unable to determine habitat which is essential to their conservation on these islands.

Based on a review of new biological information and public comments received we have revised our November 7, 2000, proposal to incorporate the following changes in addition to those described above: changes in our approach to delineating proposed critical habitat (see Criteria Used to Identify Critical Habitat); adjustment and refinement of previously identified critical habitat units to more accurately follow the natural topographic features and to avoid nonessential landscape features (agricultural crops, urban or rural development) without primary constituent elements; and, inclusion of new areas within the proposed critical habitat units that are essential for the conservation of one or more of the 83 plant species.

Critical Habitat

Critical habitat is defined in section 3 of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. ''Conservation'' means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the Act is no longer necessary.

Critical habitat receives protection under section 7 of the Act through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires conferences on Federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat. Aside from the added protection that may be provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private or other non-Federal lands that do not involve a Federal nexus, critical habitat designation would not afford any additional regulatory protections under the Act.

Critical habitat also provides non-regulatory benefits to the species by informing the public and private sectors of areas that are important for species recovery and where conservation actions would be most effective. Designation of critical habitat can help focus conservation activities for a listed species by identifying areas that contain the physical and biological features that are essential for the conservation of that species, and can alert the public as well as land-managing agencies to the importance of those areas. Critical habitat also identifies areas that may require special management considerations or protection, and may help provide protection to areas where significant threats to the species have been identified to help to avoid accidental damage to such areas.

In order to be included in a critical habitat designation, the habitat must be ''essential to the conservation of the species.'' Critical habitat designations identify, to the extent known and using the best scientific and commercial data available, habitat areas that provide at least one of the physical or biological features essential to the conservation of the species (primary constituent elements, as defined at 50 CFR 424.12(b)). Section 3(5)(C) of the Act states that not all areas that can be occupied by a species should be designated as critical habitat unless the Secretary determines that all such areas are essential to the conservation of the species. Our regulations (50 CFR 424.12(e)) also state that, ''The Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species.''

Section 4(b)(2) of the Act requires that we take into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. We may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Our Policy on Information Standards Under the Endangered Species Act, published on July 1, 1994 (59 FR 34271), provides criteria, establishes procedures, and provides guidance to ensure that decisions made by the Service represent the best scientific and commercial data available. It requires that our biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, use primary and original sources of information as the basis for recommendations to designate critical habitat. When determining which areas are critical habitat, a primary source of information should be the listing rule for the species. Additional information may be obtained from a recovery plan, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, and biological assessments or other unpublished materials.

Section 4 of the Act requires that we designate critical habitat based on what we know at the time of designation. Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that designation of critical habitat may not include all of the habitat areas that may eventually be determined to be necessary for the recovery of the species. For these reasons, critical habitat designations do not signal that habitat outside the designation is unimportant or may not be required for recovery. Areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) of the Act and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the section 9 prohibitions, as determined on the basis of the best available information at the time of the action. Federally funded or assisted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, HCPs, or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

A. Prudency Redeterminations

We originally determined that designation of critical habitat was prudent, and proposed designation of critical habitat for 76 plants from the islands of Kauai and Niihau on November 7, 2000. These species are: *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyeniii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus clayi, Hibiscus warmeae* ssp. *hannetae, Idsodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiendea membranacea, Schieda nuttallii, Schiedea spergulina* var. *leiopoda, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Sesbania tomentosa, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Viola helenae, Viola kauaiensis* var. *wahiawaensis, Wilkesia hodbdvi, Xylosma crenatum*, and *Zanthoxylum hawaiiense*. No change is made to these prudency determinations in this revised proposal and they are hereby incorporated by reference (65 FR 66808).

In the November 7, 2000, proposal we did not propose critical haibtat for three species of loulu palm, *Pritchardia aylmer-robinsonii, P. napalienses*, and *P. viscosa*. Since publication of the listing rule for *Pritchardia aylmer-robinsonii, P. napalienses*, and *P. viscosa*, we learned of instances of vandalism, collection, and commercial trade involving these three species of *Pritchardia* (65 FR 66808). In light of this information, we believed that the designation of critical habitat would likely increase the threat to these three species of *Pritchardia* on Kauai and Niihau from vandalism and collection. We determined that the benefits of designation critical habitat designation did not outweigh the potential increased threats from vandalism or collection. Given these considerations, we determined that designation of critical habitat for *Pritcharida aylmer-robinsonii, P. napalienses*, and *P. viscosa* was not prudent. During the public comment periods for the November 7, 2000, proposal two commenters suggested that critical habitat should be designated for these three species of palm if the units are of adequate ecological size or because the habitat is too inaccessible and remote for vandals. We also received comments that critical habitat should not be designated for these three species of palm because of previous acts of vandalism to listed plant species. Given the considerations described in the November 7, 2000, proposal regarding instances of vandalism, collection, and commercial trade of these species no change is made to the earlier prudency determinations for *Pritcharida aylmer-robinsonii, P. napalienses*, and *P. viscosa* in this proposal and they are hereby incorporated by reference (65 FR 66808).

In the November 7, 2000, proposal, we determined that critical habitat was not prudent for *Melicope*

quadrangularis and *Phyllostegia waimeae*, two species endemic to Kauai, because they had not been seen recently in the wild, and no viable genetic material of these species was known to exist. Therefore, such designation would be of no benefit to these species. Since publication of the November 7, 2000, proposal we received new information during the comment periods regarding the rediscovery in August 2000 of six individuals of *Phyllostegia waimeae* in Kawaiiki Valley on Kauai, and have reconsidered our earlier prudency finding. We examined the evidence available for this species and have not, at this time, found specific evidence of taking, vandalism, collection or trade of this species or of similar species. Consequently, while we remain concerned that these activities could potentially threaten *Phyllostegia waimeae* in the future, consistent with applicable regulations (50 CFR 424,12(a)(1)(i)) and the court's discussion of these regulations, we do not find that this species is currently threatened by taking or other human activity, which would be exacerbated by the designation of critical habitat. In the absence of finding that critical habitat would increase threats to a species, if there are any benefits to critical habitat designation, then a prudent finding is warranted. The potential benefits include: (1) Triggering section 7 consultation in new areas where it would not otherwise occur because, for example, it is or has become unoccupied or the occupancy is in question; (2) focusing conservation activities on the most essential areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species. In the case of *Phyllostegia waimeae* there would be some benefits to critical habitat. The primary regulatory effect of critical habitat is the section 7 requirement that Federal agencies refrain from taking any action that destroys or adversely affects critical habitat. *Phyllostegia waimeae* does not occur on Federal lands on Kauai where actions are subject to section 7 consultation. This species is located exclusively on State land with limited Federal activities, though there could be Federal actions affecting this land in the future. While a critical habitat designation for habitat currently occupied by *Phyllostegia waimeae* would not likely change the section 7 consultation outcome, since an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, there may be instances where section 7 consultation would be triggered only if critical habitat were designated. There may also be some educational or informational benefits to the designation of critical habitat. Educational benefits include the notification of landowner(s), land managers, and the general public of the importance of protecting the habitat of these species and dissemination of information regarding their essential habitat requirements. Therefore, we propose that designation of critical habitat is prudent for *Phyllostegia waimeae*.

No change is made here to the prudency determination for *Melicope quadrangularis*, a species known only from the Wahiawa drainage area on Kauai, published in the November 7, 2000, proposal and hereby incorporated by reference (65 FR 66808). *Melicope quadrangularis* was last observed in the Wahiawa drainage area in 1991 and has not been observed in this area in surveys following Hurricane Iniki in 1992 (S. Perlman and K. Wood, pers. comm., 2000). In addition, this species is not known to be in storage or under propagation. Given these circumstances, we determined that designation of critical habitat for *Melicope quadrangularis* was not prudent because such designation would be of no benefit to this species. If this species is rediscovered we may revise this proposal to incorporate or address new information as new data becomes available (See 16 U.S.C. 1532(5)(B); 50 CFR 424.13(f)).

In November 7, 2000, proposal we did not determine prudency nor propose designation of critical habitat for 14 species that no longer occur on Kauai and Niihau but are reported from one or more other islands. We determined that critical habitat was prudent and proposed designation of critical habitat for nine of these species (*Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Hibiscus brackenridgei, Ischaemum byrone, Mariscus pennatiformis, Phlegmariurus manni, Silene lanceolata*, and *Vigna o-wahuensis*) in other proposed rules published on December 18, 2000 (Maui and Kahoolawe), on December 27, 2000 (Lanai), or on December 29, 2000 (Molokai). No change is made to these prudency determinations for these nine species in this proposal and they are hereby incorporated by reference (65 FR 79192, 65 FR 82086, 65 FR 83158). In this proposal, we propose designation of critical habitat for *Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Ischaemum byrone*, and *Mariscus pennatiformis* on the island of Kauai, based on new information and information received during the comment periods on the November 7, 2000, proposal. Critical habitat is not proposed for *Hibiscus brackenridgei, Phlegmariurus manni, Silene lanceolata*, and *Vigna o-wahuensis* on the islands of Kauai and Niihau because we are unable to determine habitat which is essential to other conservation on these islands.

No changes is made here to the prudency determination for *Acaena exigua*, a species known only from Kauai and Maui, published in the proposed rule for Maui and Kahoolawe on December 18, 2000 and hereby incorporated by reference (65 FR 79192). On Kauai, this species was only known from a collection made between 1869 and 1870 (Wagner et al. 1999). On Maui, this species was last observed in 1997 and no individuals were observed during subsequent visits in 1998 and 1999 to the only known location (H. Oppenheimer and S. Perlman, pers. comm., 2000). In addition, this species is not known to be in storage or under propagation. Given these circumstances, we determined that designation would be of no benefit to this species. If this species is rediscovered we may revise this proposal to incorporate or address new information as new data becomes available (See 16 U.S.C. 1532(5)(B); 50 CFR 424.13(f)).

To determine whether critical habitat would be prudent for four other species (*Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans*, and *Solanum incompletum*) for which prudency determinations have not been made previously, and that no longer occur on Kauai but are reported from one or more other islands we analyzed the potential threats and benefits for each species in accordance with the court's order. These four plants were listed as endangered species under the Endangered Species Act of 1973, as amended 9Act) between 1991 and 1996. At the time each plant was listed, we determined that designation of critical habitat was not prudent because designation would increase the degree of threat to the species and/or would not benefit the plant. We examined the evidence available for these four species and have not, at this time, found specific evidence of taking, vandalism, collection, or trade of these species or of similar species. Consequently, while we remain concerned that these activities could potentially threaten *Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans*, and *Solanum incompletum* in the future, consistent with applicable regulations (50 CFR 424.12(a)(1)(i) and the court's discussion of these regulations, we do

not find that these species are currently threatened by taking or other human activity, which would be exacerbated by the designation of critical habitat. In the absence of finding that critical habitat would increase threats to a species, if there are any benefits to critical habitat designation, then a prudent finding is warranted. The potential benefits include (1) triggering section 7 consultation in new areas where it would not otherwise occur because, for example, it is or has become unoccupied or the occupancy is in question; (2) focusing conservation activities on the most essential areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species. In the case of *Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans*, and *Solanum incompletum* there would be some benefits to critical habitat. The primary regulatory effect of critical habitat is the section 7 requirement that Federal agencies refrain from taking any action that destroys or adversely affects critical habitat. None of these four species are reported from Federal lands on Kauai (the entire island of Niihau is privately-owned) where actions are subject to section 7 consultation. However, two of these species, *Phlegmariurus nutans* and *Solanum incompletum*, are reported from Federal lands or lands that are administered by a Federal agency on other islands (*S. incompletum* is reported from the United States Army's Pohakuloa Training Area on the island of Hawaii; *Phlegmariurus nutans* is reported from the United States Army's Schofield Barracks Military Reservation and Kawailoa Training Area, and the Service's Oahu Forest National Wildlife Refuge on Oahu). Although *Achyranthes mutica* and *Isodendrion pyrifolium* are located exclusively on non-Federal lands with limited Federal activities on the island of Hawaii, there could be Federal actions affecting these lands in the future. While a critical habitat designation for habitat currently occupied by *Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans*, and *Solanum incompletum* would not likely change the section 7 consultation outcome, since an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, there may be instances where section 7 consultation would be triggered only if critical habitat were designated. There may also be some educational or informational benefits to the designation of critical habitat. Educational benefits include the notification of landowner(s), land managers, and the general public of the importance of protecting the habitat of these species and dissemination of information regarding their essential habitat requirements. Therefore, we propose that designation of critical habitat is prudent for *Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans*, and *Solanum incompletum*.

B. Methods

As required by the Act (section 4(b)(2)) and regulations at 50 CFR 424.12, we used the best scientific data available to determine areas that are essential to conserve *Achyranthes mutica, Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Ctenitis squamigera, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia erecta, Diellia pallida, Diplazium molokaiense, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus brackenridgei, Hibiscus clayi, Hibiscus waimeae* ssp. *hannerae, Ischaemum byrone, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Kokia kauaiensis, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Mariscus pennatiformis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phlegmariurus mannii, Phlegmariurus nutans, Phyllostegia knudsenii, Phyllostegia waimeae, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea membranacea, Schiedea nuttallii, Schiedea spergulina* var. *leiopoda, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Sesbania tomentosa, Silene lanceolata, Solanum incompletum, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Vigna o-wahuensis, Viola helenae, Viola kauaiensis* var. *wahiawaensis, Wilkesia hobdyi, Xylosma crenatum,* and *Zanthoxylum hawaiiense*. This information included the known locations, site-specific species information from the HINHP database and our own rare plant database; species information from the CPC's rare plant monitoring database housed at the University of Hawaii's Lyon Arboretum; island-wide GIS coverages (*e.g.* vegetation, soils, annual rainfall, elevation contours, land ownership); the final listing rules for these 90 species; the November 7, 2000, proposal; information received during the public comment periods and the public hearing; recent biological surveys and reports; our recovery plans for these species; information received in response to outreach materials and requests for species and management information we sent to all landowners, land managers, and interested parties on the islands of Kauai and Niihau; discussions with botanical experts; and recommendations from the HPPRCC (see also the discussion below)(Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999; HPPRCC 1998; CPC, *in litt.* 1999; HINHP Database 2000; K. Wood, pers. comm., 2001; M. Buck, *in litt.* 2001; 65 FR 66808).

In 1994, the HPPRCC initiated an effort to identify and map habitat it believed to be important for the recovery of 282 endangered and threatened Hawaiian plant species. The HPPRCC identified these areas on most of the islands in the Hawaiian chain, and in 1999, we published them in our *Recovery Plan for the Multi-Island Plants* (Service 1999). The HPPRCC expects there will be subsequent efforts to further refine the locations of important habitat areas and that new survey information or research may also lead to additional refinement of identifying and mapping of habitat important for the recovery of these species.

The HPPRCC identified essential habitat areas for all listed, proposed, and candidate plants and evaluated species of concern to determine if essential habitat areas would provide for their habitat needs. However, the HPPRCC's mapping of habitat is distinct from the regulatory designation of critical habitat as defined by the Act. More data has been collected since the recommendations made by the HPPRCC in 1998. Much of the area that was identified by the HPPRCC as inadequately surveyed has now been surveyed in some way. New location data for many species has been

gathered. Also, the HPPRCC identified areas as essential based on species clusters (areas that included listed species as well as candidate species, and species of concern) while we have only delineated areas that are essential for the conservation of 83 listed species at issue. As a result, the proposed critical habitat designations in this proposed rule include not only some habitat that was identified as essential in the 1998 recommendation but also habitat that was not identified as essential in those recommendations.

C. Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider those physical and biological features (primary constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection. Such requirements include, but are not limited to: space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing of offspring, germination, or seed dispersal; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

In the November 7, 2000, proposal we determined that the designation of critical habitat was prudent for 76 plant species known currently from the islands of Kauai or Niihau and in that proposal we identified the physical and biological features that are considered essential to the conservation of the 76 species on the islands of Kauai or Niihau (65 FR 66808). In other proposals published on December 18, 2000, December 27, 2000, or on December 29, 2000, we determined that the designation of critical habitat was prudent for nine species (*Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Hibiscus brackenridgei, Ishaemum byrone, Mariscus pennatiformis, Phlegmariurus manni, Silene laceolata,* and *Vigna o-wahuensis*) that no longer occur on Kauai and Niihau but are reported from one or more other islands. Based on new information and information received during the comment periods on the November 7, 2000, proposal we have identified the physical and biological features that are considered essential to the conservation of five of these nine species (*Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Ischaemum byrone,* and *Mariscus pennatiformis*) on the island of Kauai. We are unable to identify these features for *Hibiscus brackenridgei, Phlegmariurus manni, Silene lanceolata,* and *Vigna o-wahuensis* on the islands of Kauai and Niihau based on the information available at this time. Therefore, we were not able to identify the specific areas outside the geographic areas occupied by these species at the time of their listing (unoccupied habitat) that are essential for the conservation of *Hibiscus brackenridgei, Phlegmariurus manni, Silene landeolata,* and *Vigna o-wahuensis* on the islands of Kauai or Niihau. However, proposed critical habitat designations for *Hibiscus brackenridgei, Phlegmariurus manni, Silene lanceolata,* and *Vigna o-wahuensis* were included in proposals published on December 18, 2000, December 27, 2000, or December 29, 2000 (65 FR 79192, 65 FR 82086, 65 FR 83158). In addition, we will consider proposing designation of critical habitat for *Hibiscus brackenridgei, Phlegmariurus manni, Silene lanceolata,* and *Vigna o-wahuensis* within the historic range for each species on other Hawaiian islands.

In this proposal, we determine that the designation of critical habitat is prudent for *Phyllostegia waimeae* based on new information received during the comment periods on the November 7, 2000, proposal regarding the rediscovery of this species on Kauai. Based on new information received during the comment periods we have identified physical and biological features that are considered essential to the conservation of *Phyllostegia waimeae* on the island of Kauai.

In this proposal, we determine that the designation of critical habitat is prudent for four species (*Achyranthes mutica, Isodendrion pyrifolium, Phlegmariurus nutans,* and *Solanum incompletum*) for which prudency determinations have not been made previously, and which no longer occur on Kauai but are reported from one or more other islands. Based on new information and information received during the comment periods on the November 7, 2000, proposal we have identified the physical and biological features that are considered essential to the conservation of *Phlegmariurus nutans* on the island of Kauai. We are unable to identify these features for *Achyranthes muticca, Isodendrion pyrifolium,* and *Solanum incompletum* on the islands of Kauai and Niihau based on the information available at this time. Therefore, we were not able to identify the specific areas outside the geographic areas occupied by these species at the time of their listing (unoccupied habitat) that are essential for the conservation of *Achyranthes mutica, Isodendrion pyrifolium,* and *Solanum incompletum* on the islands of Kauai and Niihau. However, we will consider proposing designation of critical habitat for *Achyranthes mutica, Isodendion pyrifolium,* and *Solanum incompletum* within the historic range for each species on other Hawaiian Islands.

All areas proposed as critical habitat are within the historical range of one or more of the 83 species at issue and contain one or more of these physical or biological features (primary constituent elements) essential for the conservation of one or more of the species.

As described in the discussions for each of the 83 species for which we are proposing critical habitat, we are proposing to define the primary constituent elements on the basis of the habitat features of the areas in which the plant species are reported from, as described by the type of plant community, associated native plant species, locale information (e.g., steep rocky cliffs, talus slopes, stream banks), and elevation. The habitat features provide the ecological components required by the plant. The type of plant community and associated native plant species indicates specific microclimate conditions, retention and availability of water in the soil, soil microorganism community, and nutrient cycling and availability. The locale indicated information on soil type, elevation, rainfall regime, and temperature. Elevation indicates information on daily and seasonal termperature and sun intensity. Therefore, the descriptions of the physical elements of the locations of each of these species, including habitat type, plant communities associated with these species, location, and elevation, as described in the Supplementary Information: Discussion of the Plant Taxa section above, constitute the primary constituent elements for these species on the islands of Kauai and Niihau.

D. Criteria Used To Identify Critical Habitat

In the November 7, 2000, proposal we defined the primary constituent elements based on the general habitat features of the areas in which the plants currently occur such as the type of plant community the plants are growing in, their physical location (e.g., steep rocky cliffs, talus slopes, stream banks), and

elevation. The areas we proposed to designate as critical habitat provided some or all of the habitat components essential for the conservation of the 76 plant species. Specific details regarding the delineation of the proposed critical habitat units were given in the November 7, 2000, proposal (65 FR 66808). In that proposal we did not include potentially suitable unoccupied habitat that is important to the recovery of the 76 species due to our limited knowledge of the historical range (the geographical area outside the area presently occupied by the species) and our lack of more detailed information on the specific physical or biological features essential for the conservation of the species.

Based on a review of new biological information and public comments received following publication of the four proposals to designate critical habitat for Hawaiian plants on Kauai and Niihau (65 FR 66808), Maui and Kahoolawe (65 FR 79192), Lanai (65 FR 82086), and Molokai (65 FR 83158), we have reevaluated the manner in which we delineated proposed critical habitat. In addition, we met with members of the HPPRCC, and State, Federal, and private entities to discuss criteria and methods to delineate critical habitat units for these Hawaiian plants.

We considered several factors in the selection and proposal of specific boundaries for critical habitat for these 83 species. For each of these species, the overall recovery strategy outlined in the approved recovery plans includes the following components: (1) stabilization of existing wild populations, (2) protection and management of habitat, (3) enhancement of existing small populations and reestablishment of new populations within historic range, and (4) research on species' biology and ecology (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999). Therefore, the long-term recovery of these species is dependent upon the protection of existing population sites and potentially suitable unoccupied habitat within historic range.

The overall recovery goal stated in the recovery plans for each of these species includes the establishment of 8 to 10 populations with a minimum of 100 mature individuals per population for long-lived perennials, 300 individuals per population for short-lived perennials, and 500 mature individuals per population for annuals. (However, there are some specific exceptions to this general recovery goal of 8 to 10 populations for species that are believed to be very narrowly distributed on a single island (e.g., the Wahiawa plant cluster (Service 1994) and *Schiedea spergulina* var. *leiopoda*), and the proposed critical habitat designations reflect this exception for these species.). To be considered recovered each population of a species endemic to the islands of Kauai or Niihau should occur on the island to which it is endemic, and likewise the populations of a multi-island species should be distributed among the islands of its known historic range (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999). A population, for the purposes of this discussion and as defined in the recovery plans for these species, is defined as a unit in which the individuals within a population could be regularly cross-pollinated, individuals that could be influenced by the same small-scale events (such as landslides), and should be considered at recover-level numbers of individuals (e.g., 100–500 individuals) for each population (rather than current numbers).

By adopting the specific recovery objectives enumerated above, the adverse effects of genetic inbreeding and random environmental events and catastrophes, such as landslides or hurricanes, that could destroy a large percentage of the species at any one time may be reduced (Menges 1990, Podolsky 2001). These recovery objectives were initially developed by the HPPRCC and are found in all of the recovery plans for these species, and are expected to be further refined as more information on the population biology of each species becomes available.

The general justification for these objectives is found in the current conservation biology literature addressing the coonservation of rare and endangered plants and animals (Beissinger and Westphal 1998; Burgman *et al.* 2001; Falk *et al.* 1996; Ginzburg *et al.* 1990; Hendrix and Kyhl 2000; Karieva and Wennergren 1995; Luijten *et al.* 2000; Meffe and Carroll 1996; Podolsky 2000; Menges 1990; Murphy *et al.* 1990; Quintana-Ascencio and Menges 1996: Taylor 1995; Tear *et al.* 1995; Wolf and Harrison 2001). The overall goal of recovery and reintroduction in the short-term is a successful population that can carry on basic life-history processes, such as establishment, reproduction, and dispersal, at a level where the probability of extinction is low. In the long-term, the species and its populations should be at a reduced risk of extinction and be adaptable to environmental change through evolution and migration. The long-term objectives, as reviewed by Pavlik, range from 50 to 2,500 individuals per population, based largely on research and theoretical modeling on endangered animals. Many aspects of species life history are typically considered to determine guidelines for species interim stability and recovery, including longevity, breeding system, growth form, fecundity, ramet (a plant that is an independent member of a clone) production, survivorship, seed duration, environmental variation, and successional stage of the habitat. Hawaiian species are poorly studied, and the only one of the afore-mentioned characteristics that can be uniformly applied to all species is longevity (i.e., long-lived perennial, short-lived perennial, and annual). In general, long-lived woody perennial species would be expected to be viable at population levels of 50 to 250 individuals per population, while short-lived perennial species would be viable at population levels of 1,500 to 2,500 individuals or more per population. These population numbers were refined for Hawaiian plant species by the HPPRCC (1994) due to the restricted distribution of suitable habitat typical of Hawaiian plants and the likelihood of smaller genetic diversity of several species that evolved from one single introduction. For recovery of Hawaiian plants, the HPPRCC recommended a general recovery guideline of 100 mature individuals per population for long-lived perennial species, 300 individuals per population for short-lived perennial species, and 500 individuals per population for annual species. These guidelines are general and we expect to revise them for individual species to incorporate new data as it becomes available.

The lack of detailed scientific data on the life history of these plant species makes it impossible for us to develop a robust quantitative model (e.g., population viability analysis (NRC 1995)) to identify the optimal number, size, and location of critical habitat units to achieve recovery (Beissinger and Westphal 1998; Burgman *et al.* 2001; Ginzburg *et al.* 1990; Karieva and Wennergren 1995; Menges 1990; Murphy *et al.* 1990; Taylor 1995). At this time, and consistent with the listing of these species, the best available information leads us to conclude that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of long-term survival and recovery of these plant species. Therefore, we used available information, including expert scientific opinion and professional judgement of non-Service scientists and members of the HPPRCC, to identify

potentially suitable habitat within the known historic range of each species.

The HPPRCC recommended the conservation and establishment of 8–10 populations to address the numerous risks to the long-term survival and conservation of Hawaiian plant species. Although absent the detailed information inherent to the types of PVA models described above (Burgman *et al.* 2001), this approach nevertheless employs two widely recognized and scientifically accepted goals for promoting viable populations of listed species—(1) Creation or maintenance of multiple populations so that a single or series of catastrophic events cannot destroy the entire listed species (Luijten *et al.* 2000; Menges 1990; Quintana-Ascencio and Menges 1996); and (2) increasing the size of each population in the respective critical habitat units to a level where the threats of genetic, demographic, and normal environmental uncertainties are diminished (Hendrix and Kyhl 2000; Luijten *et al.* 2000; Meffe and Carroll 1996; Podolsky 2000; Service 1997; Tear *et al.* 1995; Wolf and Harrison 2001). In general, the larger the number of populations and the larger the size of each population, the lower the probability of extinction (Raup 1991; Meffe and Carroll 1996. This basic conservation principle of redundancy applies to Hawaiian plants. By maintaining 8 to10 viable populations in the several proposed critical habitat units, the threats represented by a fluctuating environment are alleviated and the species has a greater likelihood of achieving long-term survival and conservation. Conversely, loss of one or more of the plant populations within any critical habitat unit could result in an increase in the risk that the entire listed species may not survive and recover.

Due to the reduced size of suitable habitat areas for these Hawaiian plant species, they are now more susceptible to the variations and weather fluctuations affecting quality and quantity of available habitat, as well as direct pressure from hundreds of species of non-native plants and animals. Establishing and conserving 8 to 10 viable populations on one or more islands(s) within the historic range of the species will provide each species with a reasonable expectation of persistence and eventual recovery, even with the high potential that one or more of these populations will be eliminated by normal or random adverse events, such as hurricanes which occurred in 1982 and 1992 on Kauai, fires, and alien plant invasions (HPPRCC 1994; Luijten *et al.* 2000; Mangel and Tier 1994; Pimm *et al.* 1998; Stacey and Taper 1992). We conclude that designation of adequate suitable habitat for 8 to 10 populations as critical habitat—and implementation of recovery actions thereon—gives the species a reasonable likelihood of long-term survival and recovery, based on currently available information. These guidelines are general and we expect to revise for individual species to incorporate new data as it becomes available.

In summary, the long-term survival and recovery requires the designation of critical habitat units on one or more of the Hawaiian islands with suitable habitat for 8 to 10 populations of each plant species. Some of this habitat is currently not known to be occupied by these species. To recover the species, it will be necessary to conserve suitable habitat in these unoccupied units, which in turn will allow for the establishment of additional populations through natural recruitment or managed reintroductions. Establishment of these additional populations will increase the likelihood that the species will survive and recover in the face of normal and stochastic events (e.g., hurricanes, fire, and non-native species introductions) (Pimm *et al.* 1998; Stacey and Taper 1992; Mangel and Tier 1994).

Changes in our approach to delineate proposed critical habitat units were incorporated in the following manner:

(1) We focused on designating units representative of the known current and historical geographic and elevational range of each species;

(2) Proposed critical habitat units would allow for expansion of existing wild populations and reestablishment of wild populations within historic range, as recommended by the recovery plans for each species; and

(3) Critical habitat boundaries were delineated in such a way that areas with overlapping occupied or suitable unoccupied habitat could be depicted clearly (multi-species units).

We began by creating rough units for each species by screen digitizing polygons (map units) using ArcView (ESRI), a computer GIS program. The polygons were created by overlaying current and historic plant location points onto digital topographic maps of each of the islands.

The resulting shape files (delineating historic elevational range and potential, suitable habitat) were then evaluated. Elevation ranges were further refined and land areas identified as not suitable for a particular species (i.e., not containing the primary constituent elements) were avoided. The resulting shape files for each species then were considered to define all suitable habitat on the island, including occupied and unoccupied habitat.

These shape files of suitable habitat were further evaluated. Several factors were then used to delineate the proposed critical habitat units from these land areas. We reviewed the recovery objectives as described above and in recovery plans for each of the species to determine if the number of populations and population size requirements needed for full recovery would be available within the critical habitat units identified as containing the appropriate primary constituent elements for each species. If more than the area needed for the number of recovery populations was identified as potentially suitable, only those areas within the least disturbed suitable habitat were designated as proposed critical habitat. A population for this purpose is defined as a discrete aggregation of individuals located a sufficient distance from a neighboring aggregation such that the two are not affected by the same small-scale events and are not believed to be consistently cross-pollinated. In the absence of more specific information indicating the appropriate distance to assure limited cross-pollination, we are using a distance of 1,000 m (3,281 ft) based on two Service biologists review of current literature on gene flow (Havens 1998; Barret and Kohn 1991; M.H. Schierup and F.B. Christiansen 1996; Fenster and Dudash 1994).

Using the above criteria, we delineated the proposed critical habitat for each species. When species units overlapped, we combined units for ease of mapping. Such critical habitat units encompass a number of plant communities. Using satellite imagery and parcel data we then eliminated areas that did not contain the appropriate vegetation, associated native plant species, or elevations such as cultivated agriculture fields, housing developments or other areas that are unlikely to contribute to the conservation of one or more of the 83 plant species. Geographic features (ridge lines, valleys, streams, coastlines, etc.) or man-made features (roads or obvious land use) that created an obvious boundary for a unit were used as unit area boundaries. We also used watershed delineations to dissect very large proposed critical habitat units in order to simplify the unit mapping and their descriptions.

Within the critical habitat boundaries, adverse modification could occur only if the primary constituent elements are affected. Therefore, not all activities within critical habitat would trigger an adverse modification conclusion. In

addition, existing features and structures within proposed areas, such as buildings, roads, aqueducts, telecommunications equipment, telemetry antennas, radars, missile launch sites, arboreta and gardens, heiau (indigenous places of worship or shrines), and other man-made features do not contain, and are not likely to develop, constituent elements and would be excluded under the terms of this proposed regulation. Therefore, unless a Federal action related to such features or structures indirectly affected nearby habitat containing the primary constituent elements, operation and maintenance of such features or structures generally would not be impacted by the designation of critical habitat. When delineating critical habitat units, we made an effort to avoid developed areas such as towns, agricultural lands, and other lands unlikely to contribute to the conservation of the 83 species.

In summary, for most of these species we utilized the approved recovery plan guidance to identify appropriately sized land units containing suitable occupied and unoccupied habitat. These areas are the Service's best estimation of the habitat necessary to provide for the recovery of these species.

E. Managed Lands

Currently occupied or historically known sites containing one or more of the primary constituent elements considered essential to the conservation of these 83 plant species were examined to determine if additional special management considerations or protection are required above those currently provided. We reviewed all available management information on these plants at these sites, including published reports and surveys; annual performance and progress reports; management plans; grants; memoranda of understanding and cooperative agreements; DOFAW planning documents; internal letters and memos; biological assessments and environmental impact statements; and section 7 consultations. Additionally, each public (*i.e.,* county, State, or Federal government holdings) and private landowner on the islands of Kauai and Niihau with a known occurrence of one of the 83 species was contacted by mail. We reviewed all information received in response to our landowner mailing and open houses held at three locations (Waimea, Lihue, and Kilauea) on the island of Kauai from October 19 to 21, 1999. When clarification was required on the information provided to us, we followed up with a telephone contact. Because of the large amount of land on the island of Kauai under State of Hawaii jurisdiction, we met with staff from Kauai's DOFAW office and Kauai State Parks to discuss their current management for the plants on their lands. And, we contacted the State's DHHL regarding management for the plants on lands under their jurisdiction (any species of aquatic life, wildlife, or plant that is federally listed as endangered or threatened is State listed as well). In addition, we reviewed new biological information and public comments received during the public comment periods and at the public hearing.

Pursuant to the definition of critical habitat in section 3 of the Act, the primary constituent elements as found in any area so designated must also require ''special management considerations or protections.'' Adequate special management or protection is provided by a legally operative plan that addresses the maintenance and improvement of the essential elements and provides for the long-term conservation of the species. We consider a plan adequate when it:

(1) Provides a conservation benefit to the species (*i.e.,* the plan must maintain or provide for an increase in the species' population or the enhancement or restoration of its habitat within the area covered by the plan);

(2) Provides assurances that the management plan will be implemented (*i.e.,* those responsible for implementing the plan are capable of accomplishing the objectives, have an implementation schedule and/or have adequate funding for the management plan); and,

(3) Provides assurances the conservation plan will be effective (*i.e.,* it identifies biological goals, has provisions for reporting progress, and is of a duration sufficient to implement the plan and achieves the plan's goals and objectives). If an area is covered by a plan that meets these criteria, it does not constitute critical habitat as defined by the Act because the primary constituent elements found there are not in need of special management.

In determining and weighing the relative significance of the threats that would need to be addressed in management plans or agreements, we considered the following:

(1) The factors that led to the listing of the species, as described in the final rules for listing each of the species. Effects of clearing and burning for agricultural purposes and of invasive non-native plant and animal species have contributed to the decline of nearly all endangered and threatened plants in Hawaii (Smith 1985; Howarth 1985; Stone 1985; Wagner *et al.* 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Vitousek 1992; Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999; Loope 1998).

Current threats to these species include non-native grass and shrub-carried wildfire; browsing, digging, rooting, and trampling from feral ungulates (including goats, deer, and pigs); direct and indirect effects of non-native plant invasions, including alteration of habitat structure and microclimate; and disruption of pollination and gene-flow processes by adverse effects of mosquito-borne avian disease on forest bird pollinators, direct competition between native and non-native insect pollinators for food, and predation of native insect pollinators by non-native hymenopteran insects (ants). In addition, physiological processes such as reproduction and establishment continue to be stifled by fruit and flower eating pests such as non-native arthropods, mollusks, and rats, and photosynthesis and water transport affected by non-native insects, pathogens and diseases. Many of these factors interact with one another, thereby compounding effects. Such interactions include non-native plant invasions altering wildfire regimes, feral ungulates vectoring weeds and disturbing vegetation and soils thereby facilitating dispersal and establishment of non-native plants, and numerous non-native insects feeding on native plants, thereby increasing their vulnerability and exposure to pathogens and disease (Howarth 1985; Smith 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Mack 1992; D'Antonio and Vitousek 1992; Tunison *et al.* 1992; Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999; Bruegmann *et al.* 2001).

(2) The recommendations from the HPPRCC in their 1998 report to us (''Habitat Essential to the Recovery of Hawaiian Plants''). As summarized in this report, recovery goals for endangered Hawaiian plant species cannot be achieved without the effective control of non-native species threats, wildfire, and land use changes.

(3) The management actions needed for assurance of survival and ultimate recovery of Hawaii's endangered plants. These actions are described in our recovery plans for these 83 species (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999), in the 1998 HPPRCC report to us (HPPRCC 1998), and in various other documents and publications relating to plant conservation in Hawaii (Mueller-Dombois 1985; Smith 1985; Stone 1985; Cuddihy and Stone 1990; Stone *et al.*

1992). In addition to monitoring the plant populations, these actions include, but are not limited to: (1) feral ungulate control; (2) non-native plant control; (3) rodent control; (4) invertebrate pest control; (5) fire management; (6) maintenance of genetic material of the endangered and threatened plants species; (7) propagation, reintroduction, and/or augmentation of existing populations into areas deemed essential for the recovery of these species; (8) ongoing management of the wild, outplanted, and augmented populations; and (9) habitat management and restoration in areas deemed essential for the recovery of these species.

In general, taking all of the above recommended management actions into account, the following management actions are ranked in order of importance (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999). It should be noted, however, that, on a case-by-case basis, some of these actions may rise to a higher level of importance for a particular species or area, depending on the biological and physical requirements of the species and the location(s) of the individual plants: feral ungulate control; wildfire management; non-native plant control; rodent control; invertebrate pest control; maintenance of genetic material of the endangered and threatened plant species; propagation, reintroduction, and/or augmentation of existing populations into areas deemed essential for the recovery of the species; ongoing management of the wild, outplanted, and augmented populations; maintenance of natural pollinators and pollinating systems, when known; habitat management and restoration in areas deemed essential for the recovery of the species; monitoring of the wild, outplanted, and augmented populations; rare plant surveys; and control of human activities/access.

As shown in Table 3, the proposed critical habitat designations for 83 species of plants are found on Federal, State, and private lands on the islands of Kauai and Niihau. In response to our public notices; letters to landowners; open houses; meetings; the November 7, 2000, proposal; public comment periods; the March 7, 2001, draft economic analysis; and the February 6, 2001, public hearing along with information in our files, we received varying amounts and various types of information on the conservation management actions occurring on these lands. Some landowners reported that they are not conducting conservation management actions on their lands while others provided information on various activities such as fencing, weeding, ungulate control, hunting, control of human access, scientific research, fire control, and propagation and/or planting of native plants.

Federal Lands

The PMRF at Barking Sands and Makaha Ridge, both on Kauai's west side, are on federally owned or State leased lands administered by the Navy for instrumented and multi-environment weapon testing and tracking. *Wilkesia hobdyi* occurs on lands at the Makaha Ridge Facility while *Sesbania tomentosa* and *Panicum niihauense* are reported from the dunes on State lands adjacent to the Barking Sands Facility at Polihale State Park. The dune system extends from Polihale State Park through the Barking Sands Facility to State-owned lands at Kekaha, and may be one of the best intact coastal dune systems remaining on the main Hawaiian Islands. We evaluated the dune habitat at the Barking Sands Facility for *Sesbania tomentosa* and *Panicum niihauense* and determined that these lands are not essential for the conservation of *Sesbania tomentosa* though they are essential for *Panicum niihauense.* The Navy is currently engaged in discussions with us to identify training-related impacts to *Wilkesia hobdyi* and *Panicum niihauense* and to develop an Integrated Natural Resources Management Plan (INRMP 2001) that will identify measures that will address the maintenance and improvement of the essential elements for these two plant species and provide for their long-term conservation.

Management at the Barking Sands and Makaha Ridge Facility lands currently consists of restricting human access and mowing landscaped areas. These actions alone are not sufficient to address the factors inhibiting the long-term conservation of *Panicum niihauense* and *Wilkesia hobdyi.* Therefore, we can not at this time find that management on these lands under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. If the Navy completes and implements an INRMP or other endangered species management plans that addresses the maintenance and improvement of the essential elements for these two plant species and provides for their long-term conservation we will reassess the critical habitat boundaries in light of these management plans. We will solicit specific comments from the Navy on their concerns on our proposed designation on military lands, and its effect of military activities. We will give full consideration to their comments, and after completing our analysis of public comments, we may exclude some or all of these Navy lands under section 4(b)(2) of the Act.

State of Hawaii Lands

The State lands on the island of Kauai include ceded and leased lands, and those that are administered by the Department of Land and Natural Resources (DLNR). DLNR lands are made up of State Parks, which are administered by the State Division of State parks; and Forest Reserves, Natural Area Reserves, and the Alakai Wilderness Preserve which are administered by the DOFAW. The DLNR also manages DHHL lands on the island of Kauai. We determined that habitat that is essential to the conservation of 74 of the 83 federally threatened or endangered plant species is found on State lands: *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia erecta, Diellia pallida, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus clayi, Hibiscus waimeae* ssp. *hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia waimeae, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pritchardia napaliensis, Pritchardia viscosa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Sesbania tomentosa, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Wilkesia hobdyi, Xylosma crenatum,* and *Zanthoxylum hawaiiense.*

Although the State conducts some conservation management actions on these lands and provides access to others who are conducting such activities, these programs do not adequately address the threats to these listed plant species on their lands. In addition, there are no comprehensive management plans for the long-term conservation of endangered and threatened plants on these lands, no updated detailed reports on management actions conducted, and no assurances that management actions will be implemented. Therefore, we cannot, at this time, find that management on these State lands is adequate to preclude a proposed designation of critical habitat. However, we will work with the State in developing conservation planning efforts.

Private Lands

We determined that habitat that is essential to the conservation of 32 of the 83 federally listed plant species is found on privately owned lands on Kauai and Niihau: *Adenophorus periens, Bonamia menziesii, Brighamia insignis, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Dubautia pauciflorula, Exocarpos luteolus, Flueggea neowawraea, Hesperomannia lydgatei, Hibiscus waimeae* ssp. *hannerae, Ischaemum byrone, Isodendrion longifolium, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Lipochaeta micrantha, Lobelia niihauensis, Munroidendron racemosum, Myrsine linearifolia, Peucedanum sandwicense, Phyllostegia wawrana, Plantago princeps, Schiedea membranacea, Schiedea nuttallii, Schiedea spergulina* var. *leiopoda, Solanum sandwicense,* and *Viola helenae,* and *Viola kauaiensis* var. *wahiawaensis.*

We received 25 responses from the over 160 private landowners who received letters inquiring about management actions on their lands. The main activities being conducted by several of these landowners are weeding, control of human access, and planting of native species. In addition, responses and comments we received during the three comment periods and the public hearing, and new information used in preparing this revised proposal did not adequately address the threats to these listed plant species on private lands on Kauai and Niihau. We are aware of only a few private landowners who are drafting management plans for their areas. Without such plans and assurances that the plans will be implemented, we are unable to find that the lands in question do not require special management or protection.

If we receive information during the public comment period that any of the lands within the proposed designations are actively managed to promote the conservation and recovery of the 83 listed species at issue in this revised proposed designation, in accordance with long term conservation plans or agreements, and there are assurances that the proposed management actions will be implemented and effective, we can consider this information when making a final determination of critical habitat.

In addition, we are aware that other private landowners and the State of Hawaii are considering the development of land management plans or agreements that may promote the conservation and recovery of endangered and threatened plant species on the island of Kauai. We support these efforts and provide technical assistance whenever possible. We are also soliciting comments on whether future development and approval of conservation measures (*e.g.* HCPs, Conservation Agreements, Safe Harbor Agreements) should trigger revision of designated critical habitat to exclude such lands, and if so, by what mechanism.

The proposed critical habitat units described below constitute our best assessment of the physical and biological features needed for the conservation of the 83 plant species, and the special management needs of these species, and are based on the best scientific and commercial information available and described above. We put forward this revised proposal acknowledging that we may have incomplete information regarding many of the primary biological and physical requirements for these species. However, both the Act and the relevant court order requires us to proceed with designation at this time based on the best information available. As new information accrues, we may reevaluate which areas warrant critical habitat designation. We anticipate that comments received through the public review process and from the public hearing will provide us with additional information to use in our decision making process and in assessing the potential impacts of designating critical habitat for one or more of these species.

The approximate areas of proposed critical habitat by landownership or jurisdiction are shown in Table 5.

TABLE 5.—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII [1]

Unit name	State/local	Private	Federal	Total
Kauai A1		2 ha (6 ac)		2 ha (6 ac)
Kauai A2		6 ha (16 ac)		6 ha (16 ac)
Kauai A3		6 ha (16 ac)		6 ha (16 ac)
Kauai B	271 ha (669 ac)			271 ha (669 ac)
Kauai C	<0.5 ha (<1 ac)	97 ha (239 ac)		97 ha (239 ac)
Kauai D1	2 ha (4 ac)	13 ha (31 ac)		15 ha (35 ac)
Kauai D2		240 ha (594 ac)		240 ha (594 ac)
Kauai E		563 ha (1,390 ac)		563 ha (1,390 ac)
Kauai F		5 ha (12 ac)		5 ha (12 ac)
Kauai G	317 ha (784 ac)			317 ha (784 ac)
Kauai H1	67 ha (165 ac)		71 ha (176 ac)	138 ha (341 ac)
Kauai H2	3 ha (7 ac)		104 ha (258 ac)	107 ha (265 ac)
Kauai H3	42 ha (103 ac)		42 ha (103 ac)	84 ha (206 ac)
Kauai I	8,226 ha (20,326 ac)	12 ha (29 ac)		8,237 ha (20,355 ac)
Kauai J	363 ha (898 ac)	5,173 ha (12,783 ac)		5,536 ha (13,681 ac)
Kauai K	718 ha (1,774 ac)	1,034 ha (2,556 ac)		1,752 ha (4,330 ac)
Kauai L	3,372 ha (8,333 ac)	35 ha (85 ac)		3,407 ha (8,418 ac)
Kauai M	1,459 ha (3,606 ac)	1,843 ha (4,554 ac)		3,302 ha (8,160 ac)
Kauai N	2,713 ha (6,704 ac)	3,886 ha (9,603 ac)		6,599 ha (16,307 ac)

TABLE 5.—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII [1]—Continued

Unit name	State/local	Private	Federal	Total
Kauai O	9,451 ha (23,355 ac)	11 ha (27 ac)		9,462 ha (23,382 ac)
Kauai Total	27,004 ha (66,728 ac)	12,926 ha (31,941 ac)	217 ha (537 ac)	40,147 ha (99,206 ac)
Niihau A		282 ha (697 ac)		282 ha (697 ac)
Grand Total	27,004 ha (66,728 ac)	13,208 ha (32,638 ac)	217 ha (537 ac)	40,429 ha (99,903 ac)

[1] Area differences due to digital mapping discrepancies between TMK data (GDSI 2000) and USGS coastline, or differences due to rounding.

Proposed critical habitat includes habitat for 83 species under private, State, and Federal jurisdiction (owned and leased lands), with Federal lands including lands managed by the Department of Defense. Lands proposed as critical habitat have been divided into 15 units (Kauai A through Kauai O) on the island of Kauai, and one unit on the island of Niihau (Niihau A). A brief description of each unit is presented below.

Descriptions of Critical Habitat Units

Kauai A

The proposed unit Kauai A (units A1 through A3) provides occupied habitat for one species: *Ischaemum byrone.* It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Kauai and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for *Ischaemum byrone,* throughout its known historical range considered by the recovery plan to be necessary for the conservation of this species. This unit also provides unoccupied habitat for one species: *Centaurium sebaeoides.* Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Kauai, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for this species of 8 to 10 populations and 500 mature individuals per population for *Centaurium sebaeoides,* throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai A).

BILLING CODE 4310–55–P

Table for Kauai A

Species	1. 8–10 pop. guidelines	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to destruction	7. Species with variable habitats.	8. Not all occupied habitat needed	9. Long-lived perennial–100/pop.	10. Short-lived perennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements	14. Hybridization is possible.	Notes
Centaurium sebaeoides	X*		X		X	X					X		X**		*Species is wide ranging.‡ **Volcanic or clay coastal cliffs with native associates.
Ischaemum byrone	X*		X		X	X				X			X**		*Species is wide ranging.‡ **Coastal shrubland, near the ocean among rocks and seepy cliffs.

This unit (Kauai A) cluster contains a total of 15 ha (38 ac) on privately owned land. It is bordered on the northeast by the coastline and on the west by Princeville or Kilauea Point. Areas of dense development and subdivisions are excluded. It is within portions of the Anini and Kauapea watersheds. The natural features include: In unit A1, inland of the beach north of Princeville and north of Princeville Makai Golf Courses; unit A2, inland of the beach

north of Princeville, including Kaweonui Point; and in unit A3, inland of Kauapea Beach, between Niu flat and Kilauea Point.

Kauai B

The proposed unit Kauai B provides occupied habitat for two species: *Hibiscus clayi,* and *Munroidendron racemosum.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations and 100 mature individuals per population for *Hibiscus clayi,* or 300 mature individuals per population for *Munroidendron racemosum,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species (see the discussion of conservation requirements in Section D, and in the table for Kauai B).

Table for Kauai B

Species	Hibiscus clayi	Munroidendron racemosum
1. 8–10 pop. guidelines	X*	X*
2. Island endemic.	X	X
3. Multi-island/current other islands.		
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.	X	X
8. Not all occupied habitat needed		X
9. Long-lived perennial–100/pop.		X
10. Short-lived perennial–300/pop.	X	
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		
14. Hybridization is possible.		
Notes	*Not enough suitable habitat exists for 8 to 10 populations at this time.	*Species is wide ranging.‡

The unit (Kauai B) contains a total of 271 ha (669 ac) on State owned land. It is bounded on the south by the Wailua watershed and on the north by the Waiakaea watershed. It contains the Nonou Forest Reserve. The natural features found in this unit are the Nonou summit, and the Nonou Mountain or Sleeping Giant.

Kauai C

The proposed unit Kauai C provides occupied habitat for two species: *Brighamia insignis* and *Lobelia niihauensis*. It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations and 100 mature individuals per population (*Brighamia insignis*) or 300 mature individuals per population (*Lobelia niihauensis*), throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species (see the discussion of conservation requirements in Section D, and in the table for Kauai C).

Table for Kauai C

Species	Brighamia insignis	Lobelia niihauensis
1. 8–10 pop. guidelines	X	X*
2. Island endemic.		
3. Multi-island/current other islands.	X	X
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.		X
8. Not all occupied habitat needed		
9. Long-lived perennial–100/pop.	X	
10. Short-lived perennial–300/pop.		X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements	X*	
14. Hybridization is possible.		
Notes	*Rocky ledges and cliffs.	*Species is wide ranging.‡

This unit (Kauai C) contains a total of 97 ha (239 ac) on State and privately owned lands. It is within the Huleia watershed. The natural features found in this unit are the cliffs north of Keopaweo and Kalanipuu summits and south of Huleia Stream (as it empties into Nawiliwili Harbor).

Kauai D

The proposed unit Kauai D (units D1 and D2) provides unoccupied habitat for one species: *Sesbania tomentosa.*

Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Kauai, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for this species of 8 to 10 populations and 300 mature individuals per population, throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai D).

Table for Kauai D

Notes	*Species is wide ranging.‡
14. Hybridization is possible.	
13. Restricted habitat requirements.	
12. Narrow endemic.	
11. Annual–500/pop.	
10. Short-lived perennial–300/pop.	X
9. Long-lived perennial–100/pop.	
8. Not all occupied habitat needed.	
7. Species with variable habitats.	X
6. Several occ. vulnerable to destruction	X
5. Non-viable populations.	X
4. Multi-island/no current other islands.	
3. Multi-island/current other islands.	X
2. Island endemic.	
1. 8–10 pop. guidelines.	X*
Species	Sesbania tomentosa

This unit (Kauai D) cluster contains a total of 255 ha (629 ac) on State and privately owned lands. It is within the Mahaulepu and Kipu Kai watersheds. The natural features include: in unit D1, Haula bay, Kamala Point, Kawailoa Bay, Kawelikoa Point, Kuahonu Point, Makawehi beach, Molehu cape, Naakea cape, Pakamoi bay, Paoo Point, and Puu Pihakapuu and in unit D2, Kaneaukai cape, Keoniloa Bay and Makahuena Point.

Kauai E

The proposed unit Kauai E provides occupied habitat for eight species: *Brighamia insignis, Delissea rhytidosperma, Isodendrion longifolium, Lipochaeta micrantha, Munroidendron racemosum, Peucedanum sandwicense, Pteralyxia kauaiensis and Schiedea nuttallii.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai and provides habitat to support one or more of the 8 to 10 populations for each species and 100 mature individuals per population for *Brighamia insignis, Munroidendron racemosum, Pteralyxia kauaiensis,* and *Schiedea nuttallii,* or 300 mature individuals per population for *Delissea rhytidosperma, Isodendrion longifolium, Lipochaeta micrantha,* and *Peucedanum sandwicense* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for two species: *Melicope haupuensis* and *Myrsine linearifolia.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 100 mature individuals per population for each species, throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai E).

Table for Kauai E

Species	1. 8–10 pop. guidelines.	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to	7. Species with variable habitats.	8. Not all occupied habitat needed.	9. Long-lived perennial–100/pop.	10. Short-lived perennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements.	14. Hybridization is possible.	Notes
Brighamia insignis	X		X		X	X			X				X*		*Rocky ledges and cliffs.
Delissea rhytidosperma	X	X			X			X		X					Not enough suitable habitat exists for 8 to 10 populations at this time.
Isodendrion longifolium	X		X		X	X		X		X			X*		*Steep slopes and some flats in gulches and stream banks.
Lipochaeta micrantha	X*	X			X	X	X			X				X	*Not enough suitable habitat exists for 8 to 10 populations at this time.
Melicope haupuensis	X	X			X	X			X				X*		*Moist tallus slopes.
Munroidendron racemosum	X*	X			X	X	X	X	X						*Species is wide ranging.‡
Myrsine linearifolia	X	X			X	X	X	X	X						
Peucedanum sandwicense	X		X		X	X		X		X			X*		*Cliff habitats.
Pteralyxia kauaiensis	X*	X			X	X	X	X	X						*Species is wide ranging.‡
Schiedea nuttallii	X		X		X	X			X				X*	X	*Cliffs in lowland diverse mesic forest dominated by Metrosideros polymorpha.

This unit (Kauai E) contains a total of 563 ha (1,390 ac) on privately owned land. It is within the Huleia, Mahaulepu and Kipu Kai watersheds. The natural features include: the Haupu summit, Hokulei Peak, Naluakeina summit, and Queen Victoria's Profile (a natural stone pillar).

Kauai F

The proposed unit Kauai F provides occupied habitat for one species: *Schiedea spergulina* var. *leiopoda.* It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population, throughout its known historical range considered by the recovery plans to be necessary for the conservation of the species (see the discussion of conservation requirements in Section D, and in the table for Kauai F).

Table for Kauai F

Species	Schiedea spergulina var. leiopoda
1. 8–10 pop. guidelines.	X*
2. Island endemic.	X
3. Multi-island/current other islands.	
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to	X
7. Species with variable habitats.	
8. Not all occupied habitat needed.	
9. Long-lived perennial–100/pop.	
10. Short-lived perennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	X
13. Restricted habitat requirements.	X* *
14. Hybridization is possible.	X
Notes	*Not enough suitable habitat exists for 8 to 10 populations at this time. **Bare rock outcrops or sparsely vegetated portions of rocky cliffs.

The unit (Kauai F) contains a total of 5 ha (12 ac) on privately owned land. It is within the Lawai watershed. The natural features include: the north-eastern facing cliffs above Lawai Stream within the NTBG property and just below the Luawai Reservoir.

Kauai G

The proposed unit Kauai G provides occupied habitat for two species: *Lipochaeta waimeaensis* and *Spermolepis hawaiiensis.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations for each species and 300 mature individuals per population (*Lipochaeta waimeaensis*), or 500 mature individuals per population (*Spermolepis hawaiiensis*), throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for one species: *Schiedea spergulina* var. *spergulina.* Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Kauai, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for this species of 8 to 10 populations and 300 mature individuals per population, throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai G).

Table for Kauai G

Species	1. 8–10 pop. guidelines.	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to	7. Species with variable habitats.	8. Not all occupied habitat needed.	9. Long-lived perennial–100/pop.	10. Short-lived perennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements.	14. Hybridization is possible.	Notes
Lipochaeta waimeaensis	X*	X			X	X				X		X	X**		*Not enough suitable habitat exists for 8 to 10 populations at this time. **Eroded soil, precipitous shrub-covered gulches.
Schiedea spergulina var. spergulina	X	X			X			X		X			X*	X	*Bare rock outcrops or sparsely vegetated portions of rocky cliffs.
Spermolepis hawaiiensis	X*		X		X		X				X				*Species is wide ranging.‡

This unit (Kauai G) contains a total of 317 ha (784 ac) on State owned land. It is within the Waimea watershed. The natural features include the east-facing cliffs of Waimea Canyon.

Kauai H

The proposed unit Kauai H (units H1 through H3) provides occupied habitat for two species: *Panicum niihauense* and *Sesbania tomentosa.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations for each species and 300 mature individuals per population for each species, throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species (see the discussion of conservation requirements in Section D, and in the table for Kauai H).

Table for Kauai H

Species	Notes
	*Not enough suitable habitat exists for 8 to 10 populations at this time. **Scattered in sand dunes in coastal shrubland.
Panicum niihauense	
1. 8–10 pop. guidelines.	X*
2. Island endemic.	
3. Multi-island/current other islands.	
4. Multi-island/no current other islands.	X
5. Non-viable populations.	X
6. Several occ. vulnerable to	X
7. Species with variable habitats.	
8. Not all occupied habitat needed.	
9. Long-lived perennial–100/pop.	
10. Short-lived perennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	X
13. Restricted habitat requirements.	X**
14. Hybridization is possible.	
Sesbania tomentosa	*Species is wide ranging.‡
1. 8–10 pop. guidelines.	X*
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to	X
7. Species with variable habitats.	X
8. Not all occupied habitat needed.	
9. Long-lived perennial–100/pop.	
10. Short-lived perennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	
13. Restricted habitat requirements.	
14. Hybridization is possible.	

This unit (Kauai H) cluster contains a total of 329 ha (812 ac) on Federal and State owned lands. It is within the Nohomalu, Kaawaloa, Niu, and Hoea watersheds. The natural features include: in unit H1, inland and along the beach in the Polihale State Park and PMRF from Barking Sands up to Nohili Point; unit H2, inland and along the beach in the PMRF including the geographic features Mana Point and Waieli Draw stream; and in H3, inland and along the beach, partially in the PMRF, including Kokole Point and up to Second Ditch next to the drag strip.

Kauai I

The proposed unit Kauai I provides occupied habitat for 49 species: *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyperus trachysanthos, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hibiscadelphus woodii, Hibiscus waimeae ssp. hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Lipochaeta fauriei, Lobelia niihauensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Peucedanum sandwicense, Phyllostegia wawrana, Plantago princeps, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea kauaiensis, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Solanum sandwicense, Stenogyne campanulata, Wilkesia hobdyi,* and *Xylosma crenatum.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations for each species and 100 mature individuals per population for *Alectryon macrococcus, Alsinidendron lychnoides, Brighamia insignis, Flueggea neowawraea, Hibiscadelphus woodii, Hibiscus waimeae* ssp. *hannerae, Kokia kauaiensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Pteralyxia kauaiensis, and Xylosma crenatum,* or 300 mature individuals per population for *Bonamia menziesii, Chamaesyce halemanui, Cyperus trachysanthos, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Isodendrion laurifolium, Isodendrion longifolium, Lipochaeta fauriei, Lobelia niihauensis, Peucedanum sandwicense, Phyllostegia wawrana, Plantago princeps, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea kauaiensis, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Solanum sandwicense, Stenogyne campanulata,* and *Wilkesia hobdyi,* or 500 mature individuals per population for *Centaurium sebaeoides,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species.

This unit also provides unoccupied habitat for eleven species: *Ctenitis squamigera, Cyanea recta, Cyanea remyi, Cyrtandra limahuliensis, Diplazium molokaiense, Hesperomannia lydgatei, Ischaemum byrone, Labordia lydgatei, Panicum niihauense, Platanthera holochila,* and *Sesbania tomentosa.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one of more additional populations necessary to meet the recovery objectives of 8 to 10 populations for each species and 100 mature individuals per population for *Hesperomannia lydgatei,* or 300 mature individuals per population for *Ctenitis squamigera, Cyanea recta, Cyanea remyi, Cyrtandra limahuliensis, Diplazium molokaiense, Ischaemum byrone, Labordia lydgatei, Panicum niihauense, Platanthera holochila,* and *Sesbania tomentosa,* throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai I).

Table for Kauai I

Species	1. 8–10 pop. guidelines.	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to	7. Species with variable habitats.	8. Not all occupied habitat needed	9. Long-lived perennial–100/pop.	10. Short-lived perennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements.	14. Hybridization is possible.	Notes
Adenophorus periens	X*		X		X					X			X**		*Species is wide ranging.‡ **Epiphyte usually growing on Metrosideros polymorpha trunks, in riparian banks of stream systems in well-developed, closed, shady canopy.
Alectryon macrococcus	X*		X		X	X		X	X						*Species is wide ranging.‡

Alsinidendron lychnoides	X	X			X	X		X	X				X*		*Steep riparian clay or silty soil banks in montane wet forests.
Bonamia menziesii	X*		X		X	X	X	X		X					*Species is wide ranging.‡
Brighamia insignis	X		X		X	X			X				X*		*Rocky ledges and cliffs.
Centaurium sebaeoides	X*		X		X	X					X		X**		*Species is wide ranging.‡ **Volcanic or clay coastal cliffs with native associates.
Chamaesyce halemanui	X	X			X	X		X		X			X*		*Steep slopes of gulches.
Ctenitis squamigera	X*		X							X			X**		*Species is wide ranging.‡ **Rock faces in gulches in the forest understory.
Cyanea recta	X	X			X	X	X	X		X					
Cyanea remyi	X	X			X	X		X		X			X*		*Tight drainages and wet stream banks in lowland wet forest or shrubland.
Cyperus trachysanthos	X*		X		X	X				X			X**		*Species is wide ranging.‡ **Wet sites on seepy flats or tallus slopes.

Cyrtandra limahuliensis	X	X			X	X		X		X			X*		*Stream banks in lowland wet forest.
Delissea rhytidosperma	X	X			X			X		X					Not enough suitable habitat exists for 8 to 10 populations at this time.
Delissea rivularis	X*	X			X	X				X			X**	X	*Not enough suitable habitat exists for 8 to 10 populations at this time. **Steep slopes near streams in wet or mesic forest.
Delissea undulata	X*		X		X	X				X			X**	X	*Not enough suitable habitat exists for 8 to 10 populations at this time. **Dry or open Metrosideros polymorpha-Acacia koa forest or Alphitonia ponderosa forest.

Diellia pallida	X	X		X	X		X		X		X*		*Bare granular soil with dry to mesophytic leaf litter with a pH of 6.9 to 7.9 on steep slopes in lowland mesic forest.
Diplazium molokaiense	X*		X						X		X**		*Species is wide ranging.‡ **Brown soil with basalt outcrops near waterfalls.
Dubautia latifolia	X*	X			X	X	X		X				*Species is wide ranging.‡
Euphorbia haeleeleana	X*		X		X	X	X		X				*Species is wide ranging.‡
Exocarpos luteolus	X	X			X	X	X		X				
Flueggea neowawraea	X*		X		X	X	X	X					*Species is wide ranging.‡
Gouania meyenii	X		X		X	X			X		X*		*Rocky ledges, cliff faces, ridge tops.
Hedyotis cookiana	X			X	X	X			X		X*		*Stream beds or steep cliffs close to waterfalls.

Hedyotis st.-johnii	X*	X			X	X		X		X		X	X**		*Species is wide ranging.‡ **Crevices of north-facing, near vertical, coastal, cliff faces.
Hesperomannia lydgatei	X	X			X		X	X	X						
Hibiscadelphus woodii	X*	X			X	X			X			X	X**		*Not enough suitable habitat exists for 8 to 10 populations at this time. **Basalt tallus or cliff walls.
Hibiscus waimeae ssp. hannerae	X	X			X	X		X	X						
Ischaemum byrone	X*		X		X	X				X			X*		*Species is wide ranging.‡ **Coastal shrubland, near the ocean among rocks and seepy cliffs.
Isodendrion laurifolium	X		X		X	X	X	X		X				X	
Isodendrion longifolium	X		X		X	X		X		X			X*	X	*Steep slopes and some flats in gulches and stream banks.

Kokia kauaiensis	X	X			X	X				X				
Labordia lydgatei	X	X			X			X		X			X*	X	*Stream banks in Metrosideros polymorpha-Dicranopteris linearis forest.
Lipochaeta fauriei	X	X			X	X		X		X			X*	X	*Side of steep gulches in diverse mesic forests.
Lobelia niihauensis	X*		X		X	X	X			X					*Species is wide ranging.‡
Melicope haupuensis	X	X			X	X			X				X*		*Moist tallus slopes.
Melicope knudsenii	X		X		X	X		X	X				X*		*Forested flats with brown granular soil.
Melicope pallida	X		X		X	X		X	X				X*		*Steep rock faces.
Munroidendron racemosum	X*	X			X	X	X	X	X						*Species is wide ranging.‡
Myrsine linearifolia	X	X			X	X	X	X	X						
Nothocestrum peltatum	X*	X			X	X		X	X				X**		*Not enough suitable habitat exists for 8 to 10 populations at this time. **Rich soil on steep slopes.

Panicum niihauense	X*			X	X	X				X		X	X**		*Not enough suitable habitat exists for 8 to 10 populations at this time. **Scattered in sand dunes in coastal shrubland.
Peucedanum sandwicense	X		X		X	X		X		X			X*		*Cliff habitats.
Phyllostegia wawrana	X	X			X			X		X				X	
Plantago princeps	X		X		X	X	X*	X		X			X*	X	*Very specific, variable habitat requirements, i.e. windswept areas near waterfalls, cliff and ridges on rocky outcrops, windblown basalt cliffs with little vegetation.
Platanthera holochila	X		X		X	X	X			X			X*		*Mixed bogs – mid to high elevation, or montane bog, wet forest, mesic scrub.
Poa mannii	X	X			X	X		X		X			X*		*Cliff or rock faces.

Poa sandvicensis	X*	X			X	X	X	X		X				*Not enough suitable habitat exists for 8 to 10 populations at this time.
Poa siphonoglossa	X	X			X	X		X		X			X*	*Shady banks on steep slopes.
Pteralyxia kauaiensis	X*	X			X	X	X	X	X					*Species is wide ranging.‡
Remya kauaiensis	X*	X			X	X		X		X			X**	*Species is wide ranging.‡ **Steep north- or northeast-facing slopes.
Remya montgomeryi	X*	X			X	X				X			X**	*Species is wide ranging.‡ **Steep north- or northeast-facing slopes.
Schiedea apokremnos	X	X			X	X				X			X*	X	*Crevices of near vertical basalt cliff faces.
Schiedea kauaiensis	X*	X			X	X				X				X	*Not enough suitable habitat exists for 8 to 10 populations at this time.
Schiedea membranacea	X	X			X	X		X		X			X*	X	*Cliff and cliff faces.

Schiedea spergulina var. spergulina	X	X			X			X		X			X*	X	*Bare rock outcrops or sparsely vegetated portions of rocky cliffs.
Solanum sandwicense	X			X	X	X	X	X		X					*Species is wide ranging.‡
Sesbania tomentosa	X*		X		X	X	X			X					
Stenogyne campanulata	X*	X			X	X				X		X	X**		*Not enough suitable habitat exists for 8 to 10 populations at this time. **Rock faces of nearly vertical north-facing cliffs.
Wilkesia hobdyi	X*	X			X	X				X			X*		*Species is wide ranging.‡ **Coastal dry cliffs or ridges.
Xylosma crenatum	X*	X			X	X	X	X	X						*Species is wide ranging.‡

This unit (Kauai I) contains a total of 8,238 ha (20,355 ac) on State and privately owned lands. It is bordered by the Kaulaula watershed in the west and Maunapuluo watershed in the east and includes the Awaawapuhi, Haeleele, Hanakapiai, Hanakoa, Hikimoe, Honopu, Hoolulu, Kaaweiki, Kalalau, Kauhao, Limahuli, Makaha, Milolii, Nahomalu, Nakeikionaiwi, Nualolo, Pohakuao, Waiahuakua, Waimea, Wainiha, and Waiolaa watersheds. The natural features include: Alapii Point, Alealau summit, Awaawapuhi Valley, Haeleele Valley, Hanakapiai Stream, Hanakoa Stream, Honopu Valley, Hoolulu Stream, Kaaalahina Ridge, Kaahole Valley, Kainamanu summit, Kalahu summit, Kalalau Beach, Kalalau Stream, Kalalau Trail, Kalalau Valley, Kalepa Ridge, Kanakou summit, Kauhao Ridge, Kauhao Valley, Kaunuohua Ridge, Kawaiula Valley, Keanapuka summit, Kopakaka Ridge, Kuia Valley, Mahanaloa Valley, Makaha Ridge, Makaha Valley, Manono Ridge, Milolii Ridge, Milolii Valley, Moaalele summit, Mukuaiki Point, Na Pali, Nianiau summit, Nualolo Valley, Paaiki Valley, Pihea summit, Pohakea summit, Poopooiki Valley, Puanaiea Point, Puu Ki summit, Puu o Kila summit, Waiahuakua summit, and Waiahuakua Stream. This unit contains portions of Haena State Park, Kokee State Park, Na Pali-Kona Forest Reserve, Polihale State Park, Puu Ka Pele Forest Reserve, and Waimea Canyon State Park and all of the Hono o Na Pali Natural Area Reserve, Kuia Natural Area Reserve, Na Pali Coast State Park, and the PMRF Makaha Ridge Facility.

Kauai J

The proposed unit Kauai J provides occupied habitat for 14 species: *Adenophorus periens, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Hesperomannia lydgatei, Hibiscus waimeae* ssp. *hannerae, Isodendrion longifolium, Labordia lydgatei, Lobelia niihauensis, Myrsine linearifolia, Peucedanum sandwicense, Plantago princeps*, and *Schiedea membranacea*. It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations for each species and 100 mature individuals per population for *Hesperomannia lydgatei, Hibiscus waimeae* ssp. *hannerae*, and *Myrsine linearifolia*, or 300 mature individuals per population for *Adenophorus periens, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Isodendrion longifolium, Labordia lydgatei, Lobelia niihauensis, Peucedanum sandwicense, Plantago princeps*, and *Schiedea membranacea*, throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species.

This unit also provides unoccupied habitat for 12 species: *Alsinidendron lychnoides, Bonamia menziesii, Brighamia insignis, Delissea rivularis, Delissea undulata, Euphorbia haeleeleana, Exocarpos luteolus, Munroidendron racemosum, Phyllostegia wawrana, Platanthera holochila, Remya montgomeryi*, and *Schiedea kauaiensis*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more additional populations necessary to meet the recovery objectives of 8 to 10 populations and 100 mature individuals per population for *Alsinidendron lychnoides, Brighamia insignis*, and *Munroidendron racemosum*, or 300 mature individuals per population for *Bonamia menziesii, Delissea rivularis, Delissea undulata, Euphorbia haeleeleana, Exocarpos luteolus, Phyllostegia wawrana, Platanthera holochila, Remya montgomeryi*, and *Schiedea kauaiensis*, throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai J).

Table for Kauai J

Species	Adenophorus periens
1. 8–10 pop. guidelines	X
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	
7. Species with variable habitats.	
8. Not all occupied habitat needed	
9. Long-lived perennial–100/pop.	
10. Short-lived perennial–300/pop.	X
11. Annual–500/pop.	
12. Poss. 1 large pop per island.	X
13. Narrow endemic.	
14. Restricted habitat requirements	X*
15. Hybridization is possible.	
Notes	*Epiphyte usually growing on Metrosideros polymorpha trunks, in riparian banks of stream systems in well-developed, closed, shady canopy.

Alsinidendron lychnoides	X	X		X	X		X	X			X*		*Steep riparian clay or silty soil banks in montane wet forests.
Bonamia menziesii	X*		X	X	X	X	X		X				*Species is wide ranging.‡
Brighamia insignis	X		X	X	X			X			X*		*Rocky ledges and cliffs.
Cyanea recta	X	X		X	X	X	X		X				
Cyanea remyi	X	X		X	X		X		X		X*		*Tight drainages and wet stream banks in lowland wet forest or shrubland.
Cyrtandra cyaneoides	X	X		X	X		X		X		X*		*Tallus rubble on steep slopes or cliff with water seeps running below, near streams or waterfalls.
Cyrtandra limahuliensis	X	X		X	X		X		X		X*		*Stream banks in lowland wet forest.

Delissea rivularis	X*	X			X	X				X				X**	X	*Not enough suitable habitat exists for 8 to 10 populations at this time. **Steep slopes near streams in wet or mesic forest.
Delissea undulata	X*		X		X	X				X				X**	X	*Not enough suitable habitat exists for 8 to 10 populations at this time. **Dry or open Metrosideros polymorpha-Acacia koa forest or Alphitonia ponderosa forest.
Euphorbia haeleeleana	X*		X		X	X	X	X		X		X				*Species is wide ranging.‡
Exocarpos luteolus	X	X			X	X	X	X		X						
Hesperomannia lydgatei	X	X			X		X	X	X							

Hibiscus waimeae ssp. hannerae	X	X		X	X		X	X					X	*Steep slopes and some flats in gulches and stream banks.
Isodendrion longifolium	X		X	X	X		X		X			X*	X	
Labordia lydgatei	X	X		X			X		X			X*	X	*Stream banks in Metrosideros polymorpha -Dicranopteris linearis forest.
Lobelia niihauensis	X*		X	X	X				X		X			*Species is wide ranging.‡
Munroidendron racemosum	X*	X		X	X	X	X	X			X			*Species is wide ranging.‡
Myrsine linearifolia	X	X		X	X	X	X	X						
Peucedanum sandwicense	X		X	X	X		X		X			X*		*Cliffs.
Phyllostegia wawrana	X	X		X			X		X				X	

Plantago princeps	X		X		X	X	X	X		X				X*	X	*Very specific, variable habitat requirements, i.e. windswept areas near waterfalls, cliff and ridges on rocky outcrops, windblown basalt cliffs with little vegetation.
Platanthera holochila	X		X		X	X	X			X				X*		*Mixed bogs – mid to high elevation, or montane bog, wet forest, mesic scrub.
Remya montgomeryi	X*	X			X	X				X		X		X**		*Species is wide ranging.‡ **Steep north- or northeast-facing slopes.
Schiedea kauaiensis	X*	X			X	X				X					X	*Not enough suitable habitat exists for 8 to 10 populations at this time.
Schiedea membranacea	X	X			X	X		X		X				X*	X	*Cliff and cliff bases.

This unit (Kauai J) contains a total of 5,536 ha (13,681 ac) on State and privately owned lands. It is bordered by the Limahuli watershed in the north, the Wainiha watershed in the south and contains a portion of the Manoa watershed. The natural features include: Hinalele Falls, Hono o Na Pali, Kilohana summit, Kulanaililia summit, Limahuli Falls, Mahinakehau Ridge, Makana summit, Maunahina Stream, Maunapuluo summit, Pali Eleele summit, Pohakukane cliff, Puu Iliahi, Puwainui Falls, Waikanaloa Wet Cave, Waikapalae Wet Cave, and Wainiha Pali. It contains portions of the Halelea Forest Reserve.

Kauai K

The proposed unit Kauai K provides occupied habitat for ten species: *Adenophorus periens, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Myrsine linearifolia*, and *Plantago princeps*. It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more of the 8 to 10 populations for each species and 100 mature individuals per population for *Hesperomannia lydgatei* and *Myrsine linearifolia*, or 300 mature individuals per population for *Adenophorus periens, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Isodendrion longifolium, Labordia lydgatei*, and *Plantago princeps*, throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for three species: *Alsinidendron lychnoides, Bonamia menziesii*, and *Schiedea membranacea*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Kauai and provides habitat to support one or more additional populations necessary to meet the recovery objectives of 8 to 10 populations for each species and 100 mature individuals per population for *Alsinidendron lychnoides*, or 300 mature individuals per population for *Bonamia menziesii*, and *Schiedea membranacea*, throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai K).

Table for Kauai K

Notes	*Species is wide ranging.‡ **Epiphyte usually growing on Metrosideros polymorpha trunks, in riparian banks of stream systems in well-developed, closed, shady canopy.
14. Hybridization is possible.	
13. Restricted habitat requirements.	X**
12. Narrow endemic.	
11. Annual–500/pop.	
10. Short-lived perennial–300/pop.	X
9. Long-lived perennial–100/pop.	
8. Not all occupied habitat needed.	
7. Species with variable habitats.	
6. Several occ. vulnerable to	
5. Non-viable populations.	X
4. Multi-island/no current other islands.	
3. Multi-island/current other islands.	X
2. Island endemic.	
1. 8–10 pop. guidelines.	X*
Species	Adenophorus periens

Alsinidendron lychnoides	X	X			X	X		X	X				X*		*Steep riparian clay or silty soil banks in montane wet forests.
Bonamia menziesii	X*		X		X	X	X	X		X					*Species is wide ranging.‡
Cyanea recta	X	X			X	X	X	X		X					
Cyanea remyi	X	X			X	X		X		X			X*		*Tight drainages and wet stream banks in lowland wet forest or shrubland.
Cyrtandra cyaneoides	X	X			X	X		X		X			X*		*Tallus on steep slopes or cliffs with water seeps running below, near streams or waterfalls.
Cyrtandra limahuliensis	X	X			X	X		X		X			X*		*Stream banks in lowland wet forest.
Hesperomannia lydgatei	X	X			X		X	X	X						
Isodendrion longifolium	X		X		X	X		X		X			X*	X	*Steep slopes and some flats in gulches and stream banks.
Labordia lydgatei	X	X			X			X		X			X*	X	*Stream banks in Metrosideros polymorpha - Dicranopteris linearis forest.

Myrsine linearifolia	X	X		X	X	X	X	X				X	
Plantago princeps	X		X		X	X	X		X		X*	X	*Very specific, variable habitat requirements, i.e. windswept areas near waterfalls, cliff and ridges on rocky outcrops, windblown basalt cliffs with little vegetation.
Schiedea membranacea	X	X		X	X		X		X		X*	X	*Cliff and cliff bases.

This unit (Kauai K) contains a total of 1,752 ha (4,330 ac) on State and privately owned lands. It is bordered on the west by the Lumahai watershed and on the east by Waioli watershed and contains a portion of the Waipa watershed. The natural features include: Hihimanu summit, Mamalahoa summit, Namolokama Mountain, and Puu Manu. The westernmost portion of this unit is in the Halelea Forest Reserve.

Kauai L

The proposed unit Kauai L provides occupied habitat for one species: *Plantago princeps*. It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Kauai, and provides habitat to support one or more of the 8 to10 populations and 300 mature individuals per population, throughout its known historical range considered by the recovery plan to be necessary for the conservation of this species. This unit also provides unoccupied habitat for 12 species: *Adenophorus periens, Bonamia menziesii, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Lysimachia filifolia, Myrsine linearifolia*, and *Platanthera holochila*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Kauai, and provides habitat to support one or more additional populations necessary to meet the recovery objectives of 8 to 10 populations for each species and 100 mature individuals per population for *Hesperomannia lydgatei* and *Myrsine linearifolia*, or 300 mature individuals per population for *Adenophorus periens, Bonamia menziesii, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Isodendrion longifolium, Labordia lydgatei, Lysimachia filifolia*, and *Platanthera holochila*, throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Kauai L).

Table for Kauai L

Species	Notes													
	1. 8–10 pop. guidelines.	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to	7. Species with variable habitats.	8. Not all occupied habitat needed.	9. Long-lived perennial–100/pop.	10. Short-lived perennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements.	14. Hybridization is possible.
Adenophorus periens	X*		X		X					X			X*	
Bonamia menziesii	X*		X		X	X	X	X		X				
Cyanea recta	X	X			X	X	X	X		X				

*Epiphyte usually growing on Metrosideros polymorpha trunks, in riparian banks of stream systems in well-developed, closed, shady canopy.

*Species is wide ranging.‡

Cyanea remyi	X	X			X	X		X		X			X*		*Tight drainages and wet stream banks in lowland wet forest or shrubland.
Cyrtandra cyaneoides	X	X			X	X		X		X			X*		*Tallus on steep slopes or cliffs with water seeps running below, near streams or waterfalls.
Cyrtandra limahuliensis	X	X			X	X		X		X			X*		*Stream banks in lowland wet forest.
Hesperomannia lydgatei	X	X			X		X	X	X						
Isodendrion longifolium	X		X		X	X		X		X			X*	X	*Steep slopes and some flats in gulches and stream banks.
Labordia lydgatei	X	X			X			X		X			X*	X	*Stream banks in Metrosideros polymorpha - Dicranopteris linearis forest.
Lysimachia filifolia	X		X		X	X				X			X*		*Mossy banks at the base of cliffs within the spray zone of waterfalls or along streams.